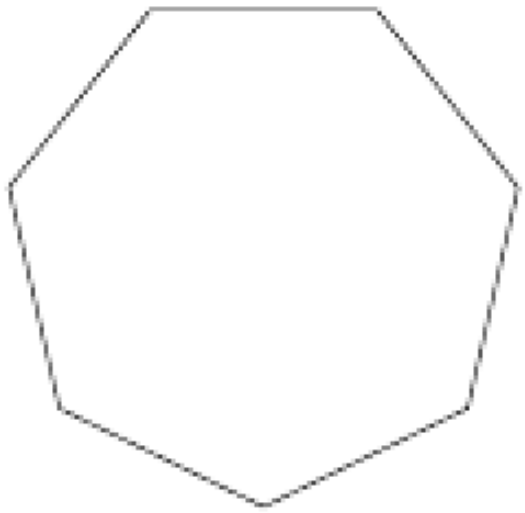
Topic: Interior angles of polygons

Question: A regular heptagon has all sides and all angles congruent. What is the measure of each angle, to the nearest tenth of a degree?



Answer choices:

A 128.6°

B 134.4°

C 139.7°

D 150.0°

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Solution: A

The sum of the angles in a polygon is

$$(n-2)180^\circ$$

where n is the number of sides in the polygon. For a heptagon, which is a seven-sided figure, that would be

$$(7-2)180^\circ = 900^\circ$$

There are seven angles, so

$$900^\circ \div 7 = 128.6^\circ$$

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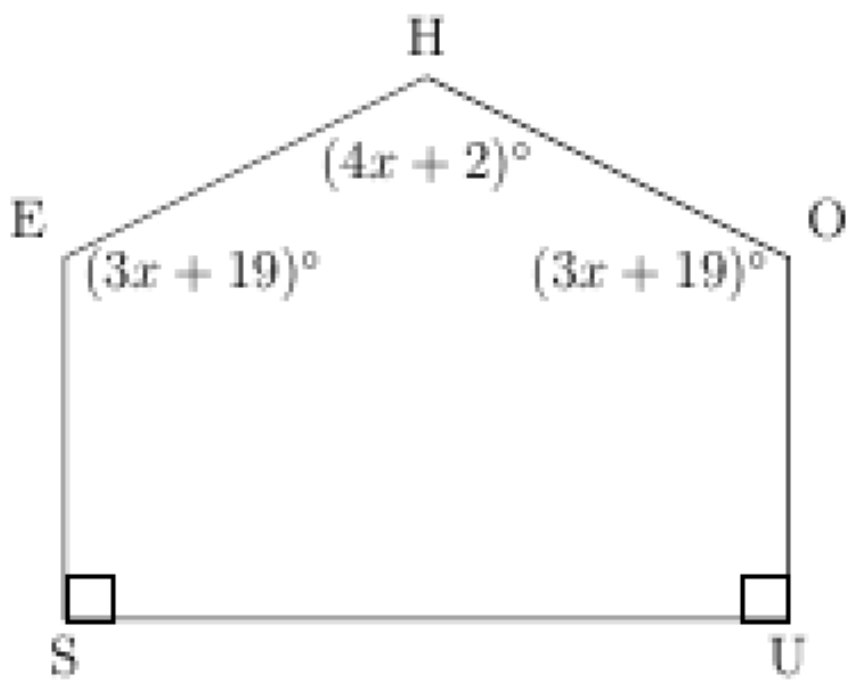
Question: Find the measure of the angle.

Find $m\angle H$.



Answer choices:

A $115°$

B $130°$

C $140°$

D $145°$

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Solution: B

The sum of the angles in a polygon is

$$(n-2)180^\circ$$

For a pentagon, that would be

$$(5-2)180^\circ = 540^\circ$$

Set the sum of the five angles equal to 540° and solve.

$$4x + 2^\circ + 3x + 19^\circ + 90^\circ + 90^\circ + 3x + 19^\circ = 540^\circ$$

$$10x + 220^\circ = 540^\circ$$

$$10x = 320^\circ$$

$$x = 32^\circ$$

Substitute 32° for x in $4x + 2^\circ$ to find $m\angle H$.

$$4(32^\circ) + 2^\circ = 130^\circ$$

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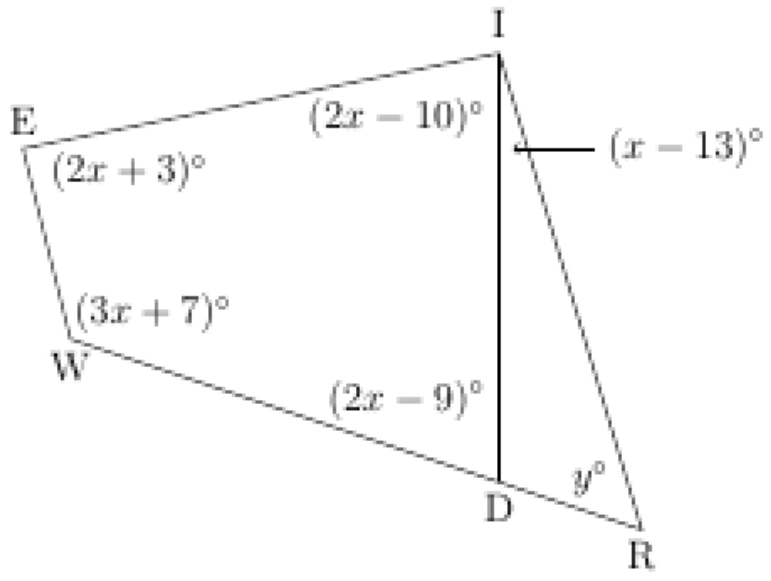
Question: Solve for the variable.

Find the value of y.



Answer choices:

A $38°$

B $43°$

C $45°$

D $48°$

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Solution: C

Find x.

In quadrilateral $WEID$ set the sum of the four angles equal to $360°$ and solve.

$$3x + 7° + 2x + 3° + 2x - 10° + 2x - 9° = 360°$$

$$x = 41°$$

Find $m\angle WDI$.

$$m\angle WDI = 2x - 9° = 2(41) - 9 = 73°$$

In ΔRDI find $m\angle RDI$ and $m\angle DIR$. $\angle WDI$ and $\angle RDI$ make a straight line, so

$$73° + m\angle RDI = 180°$$

$$\angle RDI = 180° - 73° = 107°$$

Then

$$\angle DIR = x - 13° = 41° - 13° = 28°$$

Then solve for y.

In ΔRDI, $107° + 28° + y = 180°$

$$y = 45°$$

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